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TECHNICAL BULLETIN 26

Requirements for Record Keeping and
Prototype Testing of Mattresses for Compliance
with State and Federal Flammability Laws

and

Questions and Answers about the Amended Mattress
Flammability Standard 16 CFR 1632 (FF 4-72)

February 1987

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Requirements for Record Keeping and Prototype Testing of Mattresses for Compliance with State and Federal Flammability Laws

This bulletin was prepared jointly by the State of California, Bureau of Home Furnishings, 3485 Orange Grove Avenue, North Highlands, CA 95660 (916 574-2041) and the United States Consumer Product Safety Commission, 600 Harrison Street, Room 245, San Francisco, CA 94107-1370 (415 744-2966).

Please feel free to contact either agency with any questions you may have regarding this regulation.

1. How do I find out how many prototypes I must run?

Select any mattress you make as your first prototype. Any mattress with different components affected by a smoldering cigarette (ticking, tape, batting or thread) or different construction (smooth, quilted, button top, deep panel quilted or tufted, etc.) is another prototype. Differences in deep construction (springs, sisal and other deep interior components) would probably not affect ignition of the mattress by a cigarette and therefore would not require additional prototype tests. Difference in mattress size and shape or color or pattern of ticking do not, in themselves, mean that you have another prototype. Certain changes in ticking and tape edge will change the ignition characteristics of the mattress creating a need for new prototype tests.

2. How many mattresses must I test to qualify a prototype?

You must test six surfaces for each prototype mattress. Each surface is tested with 18 lighted cigarettes - nine on the bare surface and nine under two sheets. Placement of the cigarettes is determined by the surface being tested. Detailed instruction on placement can be found in Code of Federal Regulations (16 CFR 1632.4(d)), Standard for the Flammability of Mattresses and Mattress Pads (FF 4-72, Amended). You may obtain a copy of the regulation and advice on its application to your product by contacting the nearest office of the U. S. Consumer Product Safety Commission.

3. How may I substitute components without changing the prototype and requiring a new prototype test?

You may substitute one type of ticking for another without having to reprototype the entire mattress if certain conditions are met:

A Class "A" ticking may be substituted for another Class "A" ticking, or a Class "B" ticking, or a Class "C" ticking; and

A Class "B" ticking may be substituted for another Class "B" ticking, or a Class "C" ticking without changing the prototype requiring a new prototype test.

However, Class "C" tickings may not be substituted for each other or for other tickings without changing the mattress prototype and requiring new mattress prototype tests. In short, Class "C" tickings are not interchangeable

with anything, even other Class "C" tickings, without new mattress prototype tests.

4. What do the ticking prototype classifications mean?

Class "A" ticking represents tickings evaluated as acting as barriers against cigarette ignition.

Class "B" ticking represents tickings evaluated as having no effect on cigarette ignition.

Class "C" ticking represents tickings evaluated as having the potential, in some manner, to act as a contributor to cigarette ignition.

5. Who conducts the ticking classification test?

Single thickness ticking may be tested by the ticking manufacturer or distributor, an independent testing laboratory or by the mattress manufacturer.

Quilted tickings are generally made by the mattress manufacturer. After manufacturing the quilted ticking, the mattress manufacturer may conduct the ticking classification test or have the test conducted by a supplier or distributor or an independent testing laboratory.

Two crucial points are:

(1) The test of a quilted ticking should be conducted on a sample taken from a typical unit of production, not on a sample constructed by another party from components provided by the manufacturer of the quilted ticking; and

(2) the test of a quilted ticking at one location to qualify tickings made to the same specifications at other locations is not permitted.

6. When should ticking classification tests be conducted?

For the purposes of substitution on a mattress or mattress pad, the ticking classification test should be done when the ticking (single or quilted) is in the form ready for use on a mattress or mattress pad.

7. What changes in binding tape require new prototype tests or tape edge substitution tests?

Nearly all changes in binding tape require new mattress prototype tests or tape edge substitution tests. These include changes in color of the binding tape and increases or decreases in the widths of binding tapes used. If you anticipate using different widths of binding tape, you may construct your prototype mattress using different widths in the same mattress and increase the number of cigarettes so that the required number of cigarettes are tested on each width of binding tape.

8. What does the mattress standard require of manufacturers?

This standard requires that mattress manufacturers test mattresses and keep records. A mattress manufacturer must test a prototype of a mattress to qualify that mattress for production. In essence, the prototype test

establishes that a mattress design is sufficiently fire resistant to qualify for production.

Mattress manufacturers must keep records of the prototype tests that they perform showing whether, and how, the mattress passed or failed the test. The test record should also maintain a link between the raw materials and finished product tests and should include a copy of the prototype test photographs.

Manufacturers must establish and maintain a written specification for each mattress type produced. The specification should include a detailed description of the components used at the time of mattress prototype testing. Since there is no longer a requirement for production testing to catch inadvertent change in components, manufacturers must have a means of assuring that the same components are ordered and received as supplies are restocked. Manufacturers are encouraged to check thickness and density of foams and to conduct cigarette sandwich tests on cotton batting.

Manufacturers should also keep a record of the ticking classifications used if tickings are substituted. Test results or guaranty from the supplier would be sufficient.

9. How long must records be maintained?

Records prepared under the old standard must be kept for three years from date of the test. Records prepared under the amended standard must be kept for as long as they are relied upon and for three years thereafter.

10. Where may I obtain more detailed information regarding compliance with the amendments to the mattress standard?

You may obtain a more detailed Question and Answer Sheet on the amendments and a copy of the Mattress Standard by sending a postcard to:

Compliance Officer
U. S. Consumer Product Safety Commission
600 Harrison Street, Room 245
San Francisco, CA 94107-1370

and ask for the Q & A Sheet on the Amendments to the Mattress Flammability Standard and a copy of the regulations.

QUESTIONS AND ANSWERS ABOUT THE AMENDED
MATTRESS
FLAMMABILITY STANDARD 16 CFR 1632 (FF 4-72)

Ticking Classification & Substitution Procedure

1. What components may be substituted using the ticking classification and substitution procedures?

A single thickness ticking fabric, an entire quilted ticking fabric and the single thickness ticking fabric used on the surface of a quilted ticking may be substituted using the ticking classifications and substitution procedures. In addition, the other components (foam, thread, backing, etc.) used in a quilted ticking may be substituted using the ticking classification test as the basis for

demonstrating that the change does not alter the flammability performance (i.e., alter the ticking classification).

2. Can the single thickness ticking fabric used on the surface of a quilted ticking be substituted using the ticking substitution procedure or does the entire quilted ticking have to be reclassified?

A manufacturer can substitute the single thickness ticking fabric on the surface of a quilted ticking using the ticking substitution procedure. Any other change in the components used in a quilted ticking would require a new ticking classification test of the entire quilted ticking.

3. Who conducts the ticking classification test?

Single thickness ticking may be tested by the ticking manufacturer or distributor or an independent testing laboratory. Quilted tickings are generally made by the mattress manufacturer. After manufacturing the quilted ticking, the mattress manufacturer may conduct the ticking classification test or have the test conducted by a supplier or distributor or an independent testing laboratory.

Two crucial points are:

(1) The test of a quilted ticking should be conducted on a sample taken from a typical unit of production, not on a sample constructed by another party from components provided by the manufacturer of the quilted ticking; and

(2) the test of a quilted ticking at one location to qualify tickings made to the same specifications at other locations is not permitted.

The latter position is consistent with the decision to delete the mattress prototype pooling provisions of the original standard from the amended standard. The deletion was based, in part, upon a concern that when two or more plants at widely separated locations purchase the same component materials from local suppliers, some differences may exist in the materials received at each plant. This may also be true of the components used in a quilted ticking. In addition, construction techniques may differ among manufacturing plants. Therefore, to assure that any construction techniques and/or differences which may be present in the materials utilized by each manufacturing facility will not affect cigarette ignition, the quilted ticking manufactured at each location must be classified.

4. When should the ticking classification test be conducted?
The test may be conducted for experimental purposes, at intervals prior to the final construction, if there is reason to believe that certain finishes, dyes and/or other treatments may be affecting the ticking classification. However, for purposes of substitution on a mattress or mattress pad, the ticking classification test should be done when the ticking (single or quilted) is in the form or condition ready for use in a mattress or mattress pad.

5. How frequently must the ticking classification test be conducted?

Each ticking prototype is required to be classified only once. However, any change in the descriptive characteristics enumerated for a ticking or ticking component provided in the definitions of a mattress ticking prototype (1632.6(b)(1)) and a mattress pad ticking prototype (1632.6(b)(2)) in the amended standard constitutes a new ticking prototype and means a new classification test must be conducted.

For example, a change in construction, color, weave pattern design, finish application, fiber content or weight per unit area constitutes a change and requires a new classification test for a single thickness ticking. For a quilted ticking, any change in the density of the filling, the method of quilting, the backing fabric construction, weave finish, fiber content, or weight, would require a new classification test.

6. Why must untreated cotton batting and a thin layer of foam be used under the ticking for the ticking classification testing, if thicker foam and no untreated cotton batting is used in a firm's mattress?

The ticking classification test was designed to evaluate the performance of ticking in a worst-case situation to better distinguish among the three categories of ticking (Class A - barrier; Class B - no influence; and Class C - contributor). The ticking classification test is a standardized test and is not intended to simulate the actual use by a particular firm.

Change in Materials or Method of Assembly

7. Does a change in the quilting pattern constitute a new mattress prototype and create the need to conduct a new mattress prototype test?

No. A change in the quilting pattern is not considered to be a change in the method of assembly; therefore, a new prototype test is not required. Although not specified in the standard, a prototype test conducted on a mattress surface with a quilted pattern that is large enough to allow the entire length of a lighted cigarette to lay on a stitching line is considered to be a more severe test than a test conducted on a mattress surface with a quilted pattern that only allows the butt end of a cigarette to be placed on the stitching line. With this in mind, if a mattress manufacturer is using several quilting patterns on a particular mattress prototype, we recommend the selection for prototype testing of mattress with a quilting pattern large enough to allow the entire length of a lighted cigarette to lie on the stitching line.

Consistent with the above response, a change in the quilting pattern on a quilted ticking is not considered to be a change in the method of quilting; therefore, a new ticking classification test is not required.

8. Can a Class A ticking on a smooth surface mattress be substituted with a Class A quilted ticking?

No. The use of a quilted ticking constitutes a change in the method of assembly. This change can only be made by conducting a prototype test to qualify the new mattress assembly.

9. What constitutes a change in materials, thereby resulting in the need to conduct a new test (i.e., prototype, tape edge substitution or ticking classification test)?

The descriptive characteristics enumerated for a single thickness ticking and the components of quilted ticking provided in the definition of mattress ticking prototype and mattress pad ticking prototype are the aspects of these materials believed to be critical. If there is a change (something greater than the generally accepted commercial tolerances for the material) in any of these aspects, we believe that the change constitutes "a change in materials" that must be supported by a new ticking classification test. For materials not covered in the mattress ticking prototype or mattress pad ticking prototype definitions, we consider the aspects enumerated in the example of a written specification (attached) to be the critical aspects for which a change must be supported by a new test (mattress prototype or tape edge substitution test).

One point to remember: Conducting a new test because there has been a change in materials is required only when those materials determined or suspected of influencing cigarette ignition resistance are involved.

10. (a) Does an increase in thickness of a particular material constitute a new mattress or mattress pad prototype and the need for a new prototype test?

No. As provided in the definition of mattress prototype (1632.1(j)) and mattress pad prototype (1632.1(k)), an increase in thickness is not considered a change in materials for purposes of prototype testing; therefore, a new prototype test is not required.

(b) Does an increase in the thickness of the foam used in a quilted ticking constitute a change in the ticking prototype and the need to conduct a new ticking classification test?

Yes, with one exception. The purpose of a ticking classification test is to accurately describe the ticking classification (Class A, B or C). We acknowledge that an increase in the thickness of a foam may improve the cigarette resistance of a quilted ticking (reason that an increase in thickness does not require a new mattress or mattress pad prototype test), but, at the same time, may change the classification of the quilted ticking. If the latter occurs unbeknown to the mattress manufacturer, an improper substitution of quilted ticking may occur.

Example: Quilted ticking X is initially made with a foam that is 1/4" thick and is classified as a Class B ticking. At some later date, the mattress manufacturer makes quilted ticking X using a 1/2" thick foam. The mattress manufacturer cannot assume at this point that the new quilted ticking is also a Class B ticking. The potential problem occurs if the quilted ticking with 1/2" foam is really Class A, but is identified as a Class B for purposes of mattress prototype testing and later substituted in production by a real Class B quilted ticking. This substitution could reduce the ignition resistance of the mattress because the mattress has not been qualified in prototype testing with a true Class B quilted ticking.

The one exception to the need for conducting a new

ticking classification test occurs when a mattress manufacturer is using Class A quilted ticking. An increase in the thickness of foam used in a Class A ticking should improve the cigarette ignition resistance of a quilted ticking and since there is no higher classification, the new quilted ticking can be presumed to be a Class A.

(c) Once a specific quilted ticking is being used on a specific mattress prototype, does an increase in the foam used in the quilted ticking require a new prototype test?

At this point, the foam in the quilted ticking may be increased without conducting a new mattress prototype test or a new classification test. The fact that an increase in thickness may be changing the quilted ticking classification is unimportant because the quilted ticking is already a part of the qualified mattress prototype. However, for future substitutions of the quilted ticking with the increased foam thickness on other mattress prototypes, a ticking classification test is required to accurately identify its classification.

11. Does a change (increase or decrease) in the width of the binding tape constitute a new mattress or mattress pad prototype and the need to conduct a new prototype test or a tape edge substitution test?

At the present time there is no data to demonstrate that a change (increase or decrease) in the width of the binding tape does not alter the flammability performance of a mattress. In the absence of data, a change in the width (increase or decrease) is believed to constitute a change in materials as provided by the definitions for mattress prototype and mattress pad prototype. Therefore, if a change of this nature occurs, a new prototype test or a tape edge substitution test must be conducted.

An alternative method may also be acceptable. If a mattress manufacturer anticipates the uses of a different width binding tape at some point in the future, the mattresses constructed for prototype testing may be made using more than one width of binding tape and the number of cigarettes tested on the tape edge increased so that the required number of cigarettes are tested on each width of binding tape. If data are subsequently developed by the industry which appear to demonstrate that a change in the width of the binding tape does not alter the flammability performance of a mattress, the position will be reassessed.

12. Does a change in the color of the binding tape constitute a new mattress or mattress pad prototype and the need to conduct a new prototype test or a tape edge substitution test?

At the present time there is no data to demonstrate that a change in the color of the binding tape does not alter the flammability performance of a mattress. In the absence of data, a change in the color is believed to constitute a change in materials as provided by the definitions for mattress prototype and mattress pad prototype. Therefore, if a change of this nature occurs, a new prototype test or a tape edge substitution test must be conducted.

If data are subsequently developed by the industry which appear to demonstrate that a change in the color of the binding tape does not alter the flammability performance of a mattress the position will be reassessed.

13. Does a change in the size, fiber content (i.e., polyester or nylon) or type of thread (i.e., multi-filament or two-ply) constitute a new prototype?

We believe that fiber content is the only aspect of thread that may significantly alter its flammability performance. As a result, a change in fiber content is believed to constitute a change in materials as provided by the definitions for mattress prototype, mattress pad prototype, mattress ticking prototype, and mattress pad ticking prototype. If a change of this nature occurs, a new prototype or ticking classification test must be conducted.

A change in any other aspect of the thread (i.e., size, type or other) does not constitute a change in materials as provided by the prototype definitions in the amended standard; therefore, a new prototype or ticking classification test is not required.

14. Does a change in the density of a foam used in a mattress or mattress pad, including the foam used in a quilted ticking, constitute a new prototype?

At the present time there is no data to demonstrate that a change in the density of a foam used in a mattress, mattress pad or quilted ticking does not alter the flammability performance of the item. In the absence of data, a change in density that is greater than the generally accepted commercial tolerances for foam is believed to constitute a change in materials. Therefore, if a change of this nature occurs, a new prototype test or, as appropriate, a new ticking classification test must be conducted.

If data are subsequently developed by the industry which appear to demonstrate that a change in the density of a foam does not alter the flammability performance of a mattress, mattress pad or quilted ticking, we will reassess this position.

15. Are all smooth top mattresses one prototype and all quilted top mattresses one prototype?

No. The old standard allowed all mattresses of a particular method of assembly, such as smooth top or quilted top, to be combined in the same unit for production testing, but the standard clearly indicated in the definition of the term mattress prototype that two smooth top mattresses made with different materials are two different mattress prototypes and each must be prototype tested. The amended standard no longer includes the provisions for combining mattresses or a particular method of assembly in the same unit for production testing, since the production testing requirements have been dropped. The definition of a mattress prototype remains unchanged in the amended standard.

Manufacturers may be confusing the concept of what can be combined into one prototype with their ability to

change materials that do not influence cigarette ignition resistance. For example, if one smooth top mattress is made with foam directly under a single thickness ticking and a second smooth top mattress is made with treated cotton directly under a single thickness ticking, the mattresses are two different prototypes and both must be prototype tested because the cigarette burn will penetrate the foam and cotton batting layers.

On the other hand, if two smooth top mattresses are made with foam directly under a single thickness ticking, but have different components under the foam, both mattresses can be manufactured on the basis of one prototype test. In the latter case, the manufacturer has, in essence, qualified a prototype and then made changes in the materials as allowed by the standard without having to conduct a new prototype test.

16. Once a manufacturer has qualified a smooth surface (both sides) mattress prototype and quilted surface (both sides) mattress prototype, can a mattress be made with the same smooth surface on one side and the same quilted surface on the other side without conducting a new prototype test?

The mattress with the smooth surface on one side and the quilted surface on the other side is a new mattress prototype because it is a different design and a different method of assembly. However, as long as there is no change in the materials used in making the new mattress prototype, no additional testing is necessary. A new prototype identification number must be assigned and a complete set of records prepared, including a written specification and a duplicate set of test results and photographs from the previously tested mattress prototypes.

17. Once a mattress prototype has been qualified, can the innerspring core be replaced with a water bladder without conducting a new prototype test?

Yes, as long as the cigarette burns did not penetrate to the innerspring core during the prototype test.

18. Can a flat mattress pad and a fitted mattress pad made of the same materials be combined in the same mattress pad prototype?

No. The two mattress pads do not meet the definition of a "mattress pad prototype" because they do not share the same method of assembly and are not the same design. However, the mattress standard does not restrict the number of cigarettes placed on a mattress or mattress pad during a prototype test as long as at least 18 cigarettes are burned and the cigarette spacing provisions are followed (no less than 6 inches apart). Therefore, we believe that when a flat mattress pad and a fitted mattress pad are made of the same materials, a sufficient number of cigarettes can be placed on one type of mattress pad to meet the testing requirements for both designs.

19. For mattresses that have only one intended sleeping surface and are made for use in recreational vehicles, does the presence of a mechanism for securing the non-sleeping surface to the bed frame, i.e., straps or ties

along the bottom edge, adequately inform the user that the mattress should be used with the non-sleeping surface facing down?

Neither the old nor the amended standards discuss how a non-sleeping surface should be identified. It is assumed that a non-sleeping surface will look like a non-sleeping surface and will be recognized as such by the user. In the absence of any information to the contrary, we accept the presence of a strap or ties attached to the non-sleeping surface of a mattress intended for use in a recreational vehicle as an adequate designation that the mattress should be used with the non-sleeping surface face down.

20. Does a photograph have to be taken when a quilted ticking is classified under the ticking classification or box test?

No. The amended standard does not require the photograph of a ticking fabric (single thickness or quilted) after testing in accordance with the ticking classification procedure.

Pooling Provisions

21. Will manufacturing plants relying on the pooling provisions of the old standard be required to have complete prototype test records (six surfaces) for all mattress prototypes being manufactured after the effective date of the amended standard?

Yes. For manufacturing plants that do not currently have complete prototype test records for mattress prototypes that will continue to be manufactured after the effective date of the amended standard, we suggest that the firms use the interim period between the date of publication and the effective date of the amended standard to conduct product tests that also qualify as prototype tests. This means that the production test must be conducted after the mattress has been conditioned in accordance with the standard and that all cigarette locations must meet the acceptance criteria of the standard.

Renovated Mattresses

22. Is each renovated mattress a different prototype since the old mattresses involved are likely to be different?

They are not different if the renovation procedure involves the use of the same materials and the same method of assembly in the layers that are determined or suspected of influencing the cigarette ignition resistance. From a practical point of view, this generally means that a barrier material, usually foam, known to resist the penetration of a burning cigarette is placed over the old mattress. Once this is done and one prototype test has been conducted which demonstrates that the cigarette burn does not penetrate through the barrier, the old mattress is a material that does not influence the cigarette ignition resistance and, as such, can be substituted without any additional prototype testing. The renovator should, however, remember that the use of a different material or method of assembly in the layers that are penetrated by a burning cigarette constitutes a different prototype and means that a new prototype test must be conducted.

Records

23. How long do the records required under the old standard have to be maintained?

Part 1632.2(b)(2) of the amended standard says that all mattresses manufactured after the effective date of the old standard and before the effective date of the amended standard are subject to the requirements of the old standard. This means that the records required under the old standard must be maintained in accordance with the old record retention provision (Part 1632.31(c)(4)) for as long as required by the provision. As provided, production test records must be maintained for 3 years from the date of the test and the prototype test records must be maintained for as long as they are relied upon and for 3 years thereafter.

Labeling

24. Can the month and year of manufacture and the location of manufacture be placed on the state "law tag"?

Yes, provided the information is placed below the "date of delivery line" on the law tag, is printed in black ink and is in all capital letters. All information must be printed or rubber stamped because no handwriting is permitted by state licensing laws, except when the retailer writes in the date of delivery. These guidelines have been worked out in cooperation with state licensing officials.

Although not specified by the amended standard, the manufacturer may code the month and year of manufacture and the location of manufacture, as long as the manufacturer maintains and makes available sufficient information to relate the coded data to the actual information required by the amended standard.

If the manufacturer has only one manufacturing facility in a particular city, the name of the city and the state sufficiently identifies the location of manufacture. However, if a manufacturer has two manufacturing facilities in a given city, the street address must also be included on the label to identify the location of manufacture. As indicated above, the manufacturer may code the location of manufacture, if certain information is maintained by the firm and made available upon request.

25. If I still have questions regarding compliance with the amended mattress standard, where can I get answers?

You may call your nearest CPSC Regional Office (New York, Chicago or Oakland, CA) and ask for a Compliance Officer. In California, you may call, fax or write....

California Bureau of Home Furnishings and Thermal Insulation
3485 Orange Grove Avenue
North Highlands, CA 95660-5595
Phone (916) 574-2041
Fax (916) 574-2449

or,

U.S. Consumer Product Safety Commission
Western Regional Office
1301 Clay Street, Suite 610-N
Oakland, CA 94612
(510) 637-4050
Fax (510) 637-4060.